AVIATION

The Oldest American Aeronautical Magazine

FEBRUARY 18, 1924 Issued Weekly PRICE 10 CENTS

The aerial life buoy in action: Parachute descent from a Marine Corps plane over San Diego

Official Photo, U. S. Navy

VOLUME XVI

NUMBER 7

SPECIAL FEATURES

DR. SAMUEL JOHNSON ON FLYING

APPLYING THE LAW OF FREE MOVEMENT

THE 1924 SWALLOW COMMERCIAL AIRPLANE

DANGERS OF HIGH SPEED AND ACROBATIC FLYING

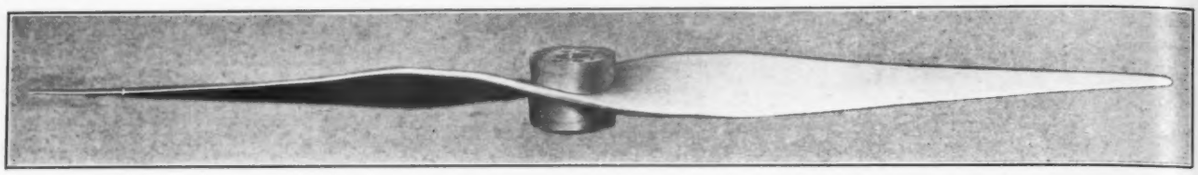
THE GARDNER, MOFFAT CO., INC.

HIGHLAND, N. Y.

225 FOURTH AVENUE, NEW YORK

Entered as Second-Class Matter, Nov. 22, 1920, at the Post Office at Highland, N. Y. under Act of March 3, 1879.

CURTISS-REED ONE-PIECE DURALUMIN PROPELLER



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FEBRUARY 18, 1924

AVIATION

VOL. XVI. NO. 7

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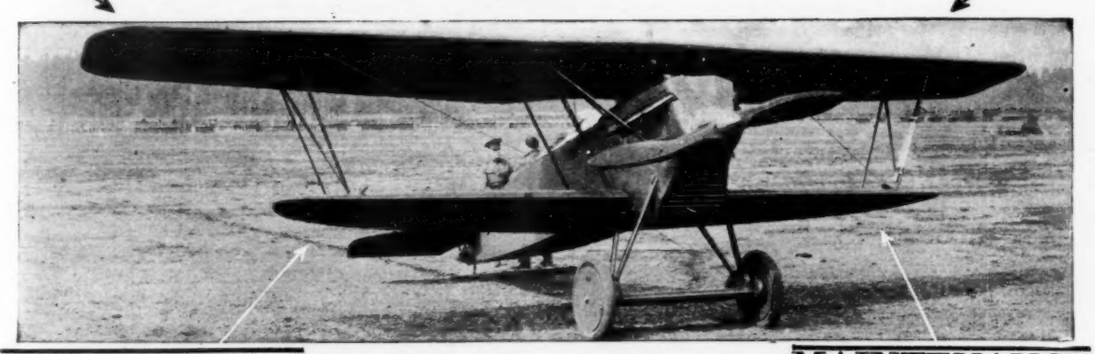

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Vol. XVI FEBRUARY 18, 1924 No. 7

Too Many Organizations

THAT too many parallel aeronautical organizations exist in this country has been well known for some time. In New York there has been the Aero Club, the Flying Club, the Aeronautical Society and a Chapter of the N.A.A. Nevertheless, activity has been practically at a standstill for several years.

Other cities have had similar parallel organizations. As an instance of the duplication of efforts where concentration should be the watchword the situation in Chicago may be cited. Here there is the pioneer Aero Club of Illinois, with its flying field and record of numerous activities in aeronautics; the Air Board of Chicago, consisting of representatives of the various clubs and organizations having their own aviation committees, which was very active for a time; the Aviation Club of Chicago, which has been kept alive by a few aeronautical enthusiasts; and lastly, the local chapter of the N.A.A., which comprises a large group of aeronautical people. So many organizations in one city arouse confused impressions not alone in the public but also among those who are trying to keep a proper record of all aviation work in the United States.

In several cities there has been a feeling that the N.A.A. should confine its activities to national matters, while the local clubs should be left free to deal with local matters. That there is a real danger here of overlapping, with duplication and inefficiency in its wake, is only too apparent.

Much praise has been given to Dayton for securing 1800 members for its local chapter. This creditable record has in its very success an element of danger. As each State is allowed representation at the Annual Convention of the N.A.A. for each twenty-five members, the preponderance of delegates from Ohio will be evident. To say that other cities should show the same initiative is overlooking the strategic position Dayton occupies. The home of the Wright brothers; the center of the Engineering activities of the Air Service, at McCook Field with over a thousand employees; the place where probably as much money was spent for building airplanes during the war as in any other city, with the resulting profits and large number of people employed—all these give Dayton an advantage that has to be taken into account. Now, with the activities of the N.A.A. largely transferred there, the coming international air races and the possibility of the Government spending $5,000,000 to build a new McCook Field, the membership in the local chapter is the natural reflection.

All the above is written for the purpose of indicating the necessity of having a clearer understanding of local problems relating to aviation. We will be glad to hear from our readers on this all important subject of the development of local aero organizations. The N.A.A. idea may be the best, but a discussion of the whole subject at this time will be helpful too.

The International Air Convention

TWO more countries—Bulgaria and Czechoslovakia—have accepted the International Convention relating to Air Navigation as the world's fundamental code of the air. Their action brings the number of countries in which the International Convention is in force up to thirteen, as follows: Belgium, Bolivia, the British Empire, Bulgaria, Czechoslovakia, France, Greece, Italy, Japan, Persia, Portugal, the Serb-Croat-Slovene Kingdom and Siam. In point of population and surface area these countries, with their dependencies and colonies, cover by far the greater part of the world. A glance at the map will show that an aviator can now fly from England to Siam without having to face any but uniform regulations covering all phases of civil air navigation. What this happy state of affairs means to pilots of aircraft, will be obvious to those who are familiar with the lasting benefits the world derives from the international conventions relating to maritime navigation and radio.

It therefore seems necessary to call once more the attention of the State Department to the urgent need of ratifying the International Air Convention which the representatives of the United States signed with certain reservations in May, 1920. Nearly four years have elapsed since then and neither the Government nor Congress have, as far as we are aware of it, taken the slightest interest in making the United States a party to the Convention. It is high time that this neglect be remedied so this country may enter the circle of nations which are cooperating in the development of international air relations.

Air navigation is, by reason of the speed and versatility of aircraft, an enterprise of essentially international scope. Its success is very largely dependent on a uniform set of laws governing the operation of aircraft. That is what the Convention was drafted for, and several years' European experience overwhelmingly proves that this agreement is based on sound lines. The Convention has had its "teething troubles" such as every new instrument of cooperation experiences, but these have largely been overcome by various amendments to the original draft.

It was reported last spring that the Pan-American Conference held in Santiago, Chile, had appointed an Inter-American Commercial Aviation Commission for the purpose of drafting an air convention which would be submitted for ratification to all the members of the Pan-American Union. If the proposed convention purposes to duplicate the International Convention we cannot see the slightest practical use for it. On the contrary, we fear that eventually, when trans-Atlantic air transport will have become an accomplished fact, the co-existence of two "international" air conventions will lead to a lot of unnecessary friction and difficulties.

Dangers of High Speed and Acrobatic Flying

By MAJ. L. H. BAUER, MEDICAL CORPS, U.S.A.

Commandant, The School of Aviation Medicine

There have been numerous reports lately in the press on the high speeds attained in the air. Lieutenant Williams of the Navy broke the record at the Pulitzer races in October when he reached a speed of 243.67 mi./hr. Later he and Lieutenant Brow vied with each other in a number of races. The fastest official speed was approximately 266 mi./hr. and this again was made by Lieutenant Williams. A halt was called at this point by Admiral Moffett on the ground that there was too much risk involved.

The Problems Involved

This, therefore, brings to our thoughts the question of how fast man can go and still live. Have we any evidence that helps us to answer this question? We have, and I shall try to point out what we really know on this subject and what we can predict with reasonable assurance of accuracy.

We have a heart and system of blood vessels for distributing our blood all over the body. In connection with the blood vessels there is a system of nerves that causes the vessels to become larger or smaller according as the particular part of the body concerned needs more or less blood.

For example, we need considerable blood in our digestive system after eating. So we divert blood there for aiding digestion. You all know that after a heavy meal you feel rather sleepy and not inclined to any effort either mental or physical. Your blood is diverted to your digestive apparatus. Likewise you probably know that if, after a heavy meal, you indulge in violent exercise, you are liable to be seized with severe cramps, or in other words, with marked indigestion. The exercise draws blood away from the digestive apparatus to the muscles, and digestion is interfered with. When we are studying, we need more blood in our brain, so more blood is diverted there, and so we might go on citing examples. We have a system of blood vessels in the abdomen known technically, as the splanchnic vessels. These vessels act as a blood reservoir and are easily dilated to hold more blood. Our circulation adapts itself to the position of the body. When we are lying down it is adapted to that position and when standing it rapidly adjusts itself to the new position. However, in certain abnormal conditions the circulation does not adjust itself as it should. When we faint, for example, there is a dilation of our splanchnic vessels, with a corresponding withdrawal of blood from the brain. Have you ever jumped quickly out of bed and felt dizzy, everything in front of your eyes becoming blurred? If so, your circulation, which was adjusted to the horizontal position in bed, did not adjust itself quickly enough to the upright position. As a result you had insufficient blood in your brain causing temporary dizziness and faintness. This will give you perhaps some idea of how a racing pilot feels as he turns the pylons. However, there is another more important factor which was chiefly responsible for symptoms. You are all familiar with the sensation of riding in fast trains or cars, particularly if you stand up. If the train goes around a curve to the left you fall toward the right. In other words, there is an action known as centrifugal force which pulls you in the direction in which the train was originally going. If, before the train turned the curve, you leaned to the left the force would pull you upright. Now a flier when flying a straightaway course has his head upright and the plane is practically horizontal; that is, the wings are parallel to the ground. Look at the diagram and note the position of plane No. 1. When a flier makes a sharp turn, say, for example, to the left, he not only turns to the left but also banks the ship so that the wings are now vertical. The position of the flier's body is therefore horizontal or parallel with the ground. See plane No. 2 in the diagram. The straight arrow shows the direction of the plane. The dotted arrow that of the direction in which he was originally flying before making the turn, and therefore the direction of the pull of centrifugal force. It will be seen that centrifugal force is acting in a direction away from the flier's head or toward his feet. So that we have two factors: 1, centrifugal force and 2, the change in position of the flier's body. Instead of leaning to one side as you might do in the train, the flier has to bank his ship to prevent accident, just as a railroad track or automobile speedway is banked higher on one side. The flier is strapped into his machine so that centrifugal force cannot pull him out of his seat, but centrifugal force does pull on his body and as a result everything in his body that can move does so in the direction of the pull. This means that his blood, which is of course, fluid, is carried away from his head into the easily enlarged splanchnic vessels already mentioned, and even into his legs. This means that he has a lack of blood in his brain or what medical men call anemia. When we have anemia of the brain we become unconscious.

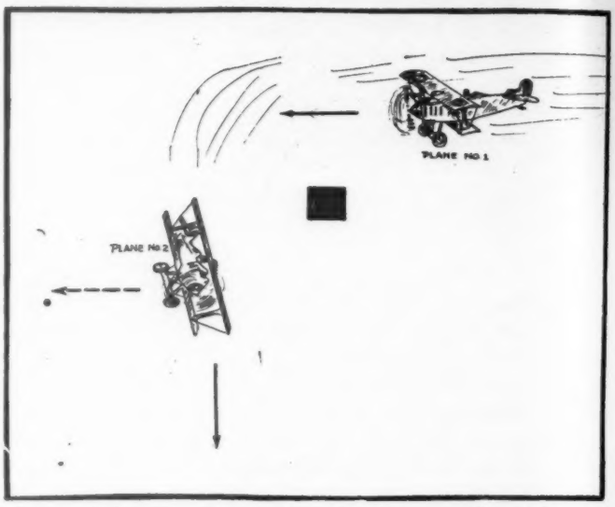


Fig. 1. Diagrammatic sketches showing one plane (No. 1) in horizontal flight and the other (No. 2) in a sharply banked turn, the effect of centrifugal force being indicated by a horizontal arrow

Hence, a flier may become unconscious when making a turn at terrific speed. When a man is flying at the rate of 4 mi./min., it will be seen that making a turn occupies but a moment. Anemia of the brain causes faintness and unconsciousness immediately. The flier quickly recovers because the circulation rapidly adjusts itself to the new position of the body and the action of the centrifugal force quickly changes to the direction of the new line of travel. At slower speeds the pilot does not become unconscious because the centrifugal action being less, anemia of the brain is not produced, and furthermore, the circulation is more readily adapted to the change of the position of the body.

How Fast Can We Fly

Is it possible to maintain a speed so great that the anemia produced will be so marked and so prolonged that recovery will not take place? The answer is probably yes.

We cannot say how great this speed will be. Experience only will show. However, we have another factor, not yet mentioned, on which we shall have to figure. Dr. Garsaux of France made some experiments with dogs. He rotated them on a wheel at speeds varying from four to six turns per second. Some of the dogs showed actual injury to the brain from the brain being pressed against the skull. Recovery followed in some, death in others. Autopsies showed that there was an anemia of the brain, and an engorgement of the vessels of the abdominal area, thus bearing out our statements about the aviator.

It is therefore not a wild theory to presume that a speed

may yet be attained which when a turn is made would be sufficient to cause pressure on the stem of the brain in such a manner as to cause death. Furthermore, the force of such violent action would be sufficient to rupture blood vessels both in the brain and in other parts of the body, which in themselves might be sufficient to cause death or lasting injury.

We talk of attaining the terrific speeds of 500 or even 1000 mi./hr. While such speeds may be mechanically possible in the future, it is very doubtful if a human being will be able to stand such speeds. A straight ahead speed will, of course, cause less effect than turning at the same speed. So we may

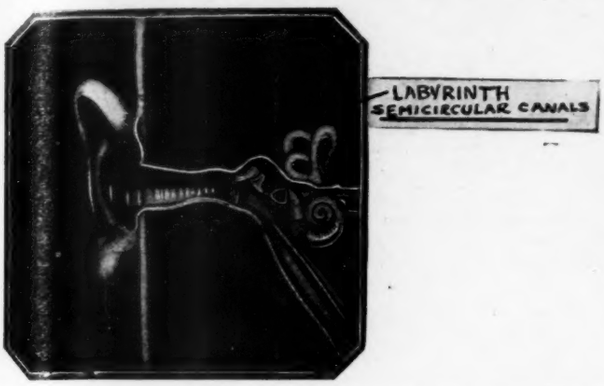


Fig. 2. Cross section of the human ear and labyrinth, showing semicircular canals

say that a flier may fly straight ahead at much greater speed than he can if he makes a turn.

What May Happen at High Speeds

I have not mentioned the sensations with which all fliers are familiar, namely, the tingling of the scalp, the ballooning of the cheeks if the mouth is opened and the pressure against the arm if it is extended out from the cockpit. At high speeds if any of these things are done serious injury will result. Even at 250 mi./hr. if the pilot should hold his arm out, it would probably be broken and at higher speeds perhaps torn off. Should he open his mouth so as to receive the force of the wind, his cheeks would be badly lacerated at least. Should he stand up with his head well above the cockpit, he would be knocked backward and his neck probably broken.

Attention has been called to the importance of the semicircular canals in the inner ear in speed flying. Personally, I believe they play little or no part in the speed phenomena. However, since there has been confusion on the point, it seems worth while to review the physiology of equilibrium.

Equilibrium or the ability to know the position of one's body in relation to space, at all times, and to maintain the desired position is a complex affair. We take it perhaps as a matter of course but it is far from that. We receive sensations from our eyes, ears, skin, muscles, joints and tendons, which information we correlate. As a result we known instinctively, (if we be healthy), whether we are standing up, sitting down, where our legs and arms are and so forth, and in which direction we are moving provided the motion is not too sudden or fast. Even if it is pitch dark we know whether our head is upright or turned to one side, because of the various sensations received which we have learned correctly to interpret.

Sensitiveness to Motion

We are accustomed to motion, chiefly, in a horizontal plane, though in an elevator we experience motion in a vertical plane. Movement in a circle, however, we are accustomed to in a moderate degree only in the horizontal plane. Severe motion in that plane or rotary motion in the vertical planes make us dizzy. Many of you have been seasick. This is because you are sensitive to motion. The up and down pitch and the side to side roll of the ship are motions to which you are not accustomed. Seasickness and airsickness have the same cause. People vary in their reactions to motion. Some are slightly disturbed, some are violently so. The latter can often be trained to get over their sensitiveness, just as perhaps you have got over your seasickness after two or three days at sea.

The flier maneuvers in all three planes. He loops, he rolls and he spins. His position with respect to the horizon is constantly changing. To one unaccustomed to these rapid changes of position the sensations are very disturbing, nausea, vertigo and confusion resulting. What is it, that causes these unpleasant sensations?

First of all, our eyes are partly responsible. The constant changing of the position of the landscape or the horizon is very disturbing to some people. Usually, fliers who are doing stunt flying will tell you that they keep their eyes fixed in the cockpit or on some designated point, in order not to be confused by the revolving landscape.

Sickness Comes from Ears

However, our eyes are only partly responsible for our sensations. We receive information through our nerves from our muscles and joints that tell us our position. This does not make us sick, however. The element of sickness (aside from that caused by our eyes) comes from our ears. By ears, I do not mean the hearing part of the ear. There is an external ear, a middle ear, and an internal ear. It is the internal ear with which we are concerned and with only a portion of that. The internal ear is divided into what are known as cochlea which have to do solely with hearing, and a labyrinth which has to do with equilibrium. This labyrinth is divided into a vestibule with three semicircular canals connecting with it and through it with each other. These canals are known as the horizontal, which roughly speaking is parallel to the ground and has to do with sensations of motion in a horizontal plane; and two vertical canals, one of which, roughly speaking, is in a vertical plane from right to left and the other also in a vertical plane but from before backward. These have to do with sensations of motion in those planes. Thus all three planes are cared for by these canals. There are two sets of these canals, one set on either side of the head. The vestibule mentioned above acts as a central reservoir and is supposed to be concerned with position rather than motion. A diagram is given below which is a cross section of the internal ear, showing how this apparatus is constructed.

These canals and the vestibule are filled with fluid known as endolymph. There are certain areas in the canal that are exceedingly sensitive. Now physiologists are not agreed as to how this fluid functions. One school claims that motion by the individual sets up a flow of this fluid in the canals that stimulates these sensitive areas and causes certain sensations. Another school maintains that there is no flow but that the sensations result from change of pressures on these sensitive areas. With this dispute we need not be concerned because it does not matter for our purpose which is correct.

Physical Misinformation

At any rate, motion in any plane causes sensations that make us aware of this motion. Now, were this all, there would be no trouble, but unfortunately we receive misinformation from our vestibular apparatus. For example, if you close your eyes and are turned rapidly to the right, you at first will feel as though you were turning to the left, then you will seem to be standing still, and if you then stop turning, you will feel as though you were turning to the left. The reason for this is, that the stimulation set up in your ears by this motion, persists after the motion has ceased and gives you therefore the sensation of continuing to move, but in the opposite direction. If you are turned to the right, with your head bent forward 120 deg., and then the turning is stopped and you attempt to sit up, you will fall over to the right, because you have a feeling that your chair is tipping to the left and you lean to the right to overcome it. Of course, your chair is not tipping and so you will actually fall to the right. Again suppose you are turned rapidly to the right and are then stopped suddenly. Suppose the examiner standing in front of you tells you to raise an arm and come down and touch his finger. Invariably you will come down beyond his finger (to your right) because you will have the sensation of turning away from his finger, and reach back (as you believe) where his finger ought to be (according

to your sensations). These false sensations are known as dizziness or vertigo. Every flier is familiar with these tests. He goes through them in the turning chair usually twice a year. These false sensations already referred to are experienced by the flier in stunt flying, and unless he has learned to interpret them properly, it will be readily seen that he may become confused and lose his sense of direction and position and crash before he can straighten out his ship. The experienced flier is troubled less by vertigo. He has become used to these sudden changes of position and knows how to interpret his sensations and rarely becomes confused. A novice, however, not infrequently is killed in stunt flying because of the resulting vertigo he experiences.

Not all fliers are equally susceptible to motion. Some are much more so than others. What fliers usually do not understand is, that their reactions to motion may change from time to time. The pilot who is suffering from staleness not infrequently becomes hypersensitive to motion. The experienced flier in good condition is apt to show less and less reaction on his tests. This is particularly true of the test pilot. He has learned to make allowance for his wrong sensations and eventually does so almost without realizing it. The only danger is that occasionally he overcompensates. For example, after being whirled to the right, instead of falling to the right, he not only overcomes this tendency enough to remain upright, but he overcompensates and falls to the left.

The Law of Free Movement

By C. FRANCIS JENKINS

Any object free to move in a fluid will move toward that part of the fluid having the swiftest motion.

The above physical law should be very useful to the airplane designer, for it suggests the best wing sections and the location of supporting surfaces with respect to the slipstream.

What the Law Explains

It also explains many common phenomena not explained by any other law. For example, why leaves are "sucked up" into the air; why heavy boards are picked up and transported great distances by high winds; and even frame buildings pulled apart in violent windstorms.

This law also explains why great plate glass windows are blown *out* in storms. In normal conditions, the pressure on each side of the glass is the same, but as the wind outside grows in velocity the static pressure inside increases until it overcomes the strength of the plate and the whole gives way with explosive violence, the thousands of pieces being blown outward.

Some time since a flying machine hangar collapsed in a high wind. It had been closed on account of an approaching storm. The sides were sucked *out* into the air stream, and the roof dropped on top of the planes inside, wrecking them.

There is abundant evidence that the law applies equally in liquids, also, accounting for the peculiar behavior of bodies in moving water.

Why, for example, a log thrown into a swiftly running stream is quickly "drawn" to the middle and rides on the crest of the flood, the crest itself resulting from the same cause; why the strong swimmer is sucked down in the ocean undertow; why buoyant bodies going over a waterfall come to the surface only in the quiet water some distance away, although a bolt of wood dropped endwise into a pond bobs up immediately; why power boats going in the same direction collide if they get too close together; why speed boats sink by the stern; and why the bobbing ball stays in the water jet of the fountain on the lawn.

Did you ever put a marble in the funnel-shaped end of the lawn-hose nozzle, and discover that the stream of water will not dislodge it? It is an astonishing discovery to most people.

Applies to All Fluids

The law applies as well to two dissimilar fluids, water and air, for example, and that is the reason for the waves of the sea, which are higher the stronger the wind.

Water may also capture the air. When one draws a glass of water the stream carries air down into the glass filling it with little air bubbles, which quickly rise to the top and escape. A very efficient air pump is made on this principle, a pump without moving parts.

As another illustration: Many tons of small grain are daily moved to higher levels by pouring a stream of it onto a swiftly running flat belt-conveyer, the stream humping itself up in the middle of the belt and not a grain falling off

It is all very plain when we remember the law, i.e., that the body must move toward the swiftest part of the adjacent fluid medium, and that this force is increasingly powerful as the difference of flow in adjacent parts of the fluid stream increases.

This law explains why soaring birds ride the air without effort. The eagle, in America, is noted for this gift of nature, though he soars too high for convenient observation, but sea gulls and the albatros perform low where their movements can be studied easier. Into the wind each seems to advance without effort, going up and ahead without flapping wings.

A thick leading edge of the wing with an eddy-forming hollow just behind the bone underneath, and a downward slope toward the trailing edge, tend to slow up the air stream below; while the "down-hill" slope of the smooth upper surface of the wing increases the wind velocity above. The result is that nearly the whole lift is represented by the effort of the wing to get up into the swiftest flow of air.

The study of bird flight will be useful to the airplane designer, in the study of glider planes, but is apt to mislead him in the design of motor-driven planes, for the reason that the mechanics of propulsion is as different between bird and airplane as is the support of horse and wagon by legs and wheels, respectively.

Its Application to Airplane Design

If the plane designer takes this new law into friendly consideration he must immediately conclude that if the motor be so located that the slip-stream passes *above* the wing, the greatest lift is realized, and the greatest economy of fuel for a given speed. The slipstream below the wing surface puts an unnecessary dead load on the plane, like running an automobile while the brakes are partly set.

A monoplane tractor with the wings low on the fusilage should, therefore, be the most economical design. A biplane with a gap in the upper wing as wide as the slipstream should be more efficient than a wing of the conventional type, unbroken from tip to tip, because little of the slipstream will pass below the wing surface and, therefore, will not have a "down effect" on the supporting surface.

These facts are of very great importance, and can be rather definitely determined by the simple method of adding an artificial slipstream to the equipment of any standard wind tunnel so that the slipstream may be directed toward various parts of a standard plane model. An adjustable-speed auxiliary blower might be provided to blow through a suitable size slipstream tube moveably directed toward the model. The speed of the blower should be such that the increased air velocity through this tube represents the excess velocity of the slipstream over the normal wind velocity.

New British Air Minister

The fall of the Baldwin cabinet in England has also brought about the resignation of Sir Samuel Hoare, Air Minister. His post in the cabinet headed by Ramsey Macdonald has been entrusted to Brig. Gen. Christopher Thompson. The new air minister has a brilliant war record, particularly as intelligence officer on the Balkan front.

Dr. Samuel Johnson on the Art of Flying

Aeronautical Speculations of the Eighteenth Century

AEROSTATION OUT AT ELBOWS
OR THE ITINERANT AERONAUT.

Behold an Hero comely tall and fair !

His only Food Phlogisticated Air !
Now on the Wings of Mighty Winds he rides !
Now torn thro' Hedges !—Dashed in Oceans tides !

Now drooping roams about from Town to Town
Collecting Pence t' inflate his poor Balloon;
Pity the Wight and something to him give,
To purchase Gas to keep his Frame alive.

Reproduction of a rare print published in London, 1786, now in possession of the Aeronautical Chamber of Commerce.

Through the courtesy of Robert H. Davis of Munsey's Magazine, AVIATION *is able to reproduce below a part of Chapter VI of Rasselas by Dr. Samuel Johnson, called "A Dissertation on the Art of Flying." While the type of this contribution is not strictly in our field, it is such a prophetic piece of literature that we are certain it will interest our readers.*

It will be noted that many of the actual problems of flights were foreseen by Dr. Johnson, not the least of which is his perception of the difficulties of taking off. Later he also experienced one of the earliest recorded "crashes." Darius Green's ancestor is here located.

Even the secretive side of the aeronautical designer is cleverly anticipated. AVIATION, *too, wishes that only the "good" and "virtuous" had been taught to fly. Much distress would thus have been avoided.*—EDITOR.

Among the artists that had been allured into the happy valley, to labour for the accommodation and pleasure of its inhabitants, was a man eminent for his knowledge of the mechanic powers, who had contrived many engines both of use and recreation. By a wheel, which the stream turned, he forced the water into a tower, whence it was distributed to all the apartments of the palace. He erected a pavilion in the garden, around which he kept the air always cool by artificial showers. One of the groves, appropriated to the ladies, was ventilated by fans to which the rivulet that ran through it gave a constant motion; and instruments of soft music were placed at proper distances, of which some played by the impulse of the wind, and some by the power of the stream.

This artist was sometimes visited by Rasselas, who was pleased with every kind of knowledge, imagining that the time would come when all his acquisitions should be of use to him in the open world. He came one day to amuse himself in his usual manner, and found the master busy in building a sailing chariot: he saw that the design was practicable on a level surface, and with expressions of great esteem solicited its completion. The workman was pleased to find himself so much regarded by the prince, and resolved to gain yet higher honours. "Sir," said he, "you have seen but a small part of what the mechanic sciences can perform. I have been long of opinion, that instead of the tardy conveyance of ships and chariots, man might use the swifter migration of wings: that the fields of air are open to knowledge, and that only ignorance and idleness need crawl upon the ground."

This hint rekindled the prince's desire of passing the mountains; having seen what the mechanist had already performed, he was willing to fancy that he could do more; yet resolved to inquire further, before he suffered hope to afflict him by disappointment. "I am afraid," said he to the artist, "that your imagination prevails over your skill, and that you now tell me rather what you wish, than what you know. Every animal has his element assigned him; the birds have the air, and man and beast the earth." "So," replied the mechanist, "fishes have the water, in which yet beasts can swim by nature, and men by art. He that can swim needs not despair to fly; to swim is to fly in grosser fluid, and to fly is to swim in a subtler. We are only to proportion our power of resistance to the different density of matter through which we are to pass. You will be necessarily upborne by the air, if you can renew any impulse upon it faster than the air can recede from the pressure."

"But the exercise of swimming," said the prince, "is very laborious; the strongest limbs are soon wearied; I am afraid the act of flying will be yet more violent; and wings will be of no great use, unless we can fly further than we can swim."

"The labour of rising from the ground," said the artist, "will be great, as we see it in the heavier domestic fowls, but as we mount higher, the earth's attraction, and the body's gravity, will be gradually diminished, till we shall arrive at a region where the man will float in the air without any tendency to fall; no care will then be necessary but to move forwards, which the gentlest impulse will effect. You, Sir, whose curiosity is so extensive, will easily conceive with what pleasure a philospher, furnished with wings, and hovering in the sky, would see the earth, and all its inhabitants, rolling beneath him, and presenting to him successively, by its diurnal motion, all the countries within the same parallel. How must it amuse the pendent spectator to see the moving scene of land and ocean, cities and deserts! To survey with equal security the marts of trade, and the fields of battle; mountains infested by barbarians, and fruitful regions gladdened by plenty and lulled by peace! How easily shall we then trace the Nile through all his passage; pass over to distant regions, and examine the face of nature from one extremity of the earth to the other!"

"All this," said the prince, "is much to be desired; but I am afraid that no man will be able to breathe in these regions of speculation and tranquility. I have been told, that respiration is difficult upon lofty mountains, yet from these precipices, though so high as to produce great tenuity of air, it is very easy to fall: therefore I suspect, that from any height, where life can be supported, there may be danger of too quick descent."

"Nothing," replied the artist, "will ever be attempted, if all possible objections must be first overcome. If you will favour my project, I will try the first flight at my own hazard. I have considered the structure of all volant animals, and find the folding continuity of the bat's wings most easily accommodated to the human form. Upon this model I shall begin my task to-morrow, and in a year expect to tower into the air beyond the malice and pursuit of man. But I will work only on this condition, that the art shall not be divulged, and that you shall not require me to make wings for any but ourselves."

"Why," said Rasselas, "should you envy others so great an advantage? All skill ought to be exerted for universal good; every man has owed much to others, and ought to repay the kindness that he has received."

"If men were all virtuous," returned the artist, "I should with great alacrity teach them all to fly. But what would be the security of the good, if the bad could at pleasure invade them from the sky? Against an army sailing through the clouds, neither walls, nor mountains, nor seas, could afford any security. A flight of northern savages might hover in the wind and light at once with irresistible violence upon the capital of a fruitful region that was rolling under them. Even this valley, the retreat of princes, the abode of happiness, might be violated by the sudden descent of some of the naked nations that swarm on the coast of the southern sea."

The prince promised secrecy, and waited for the performance, not wholly hopeless of success. He visited the work from time to time, observed its progress, and remarked many ingenious contrivances to facilitate motion, and unite levity with strength. The artist was every day more certain that he should leave vultures and eagles behind him, and the contagion of his confidence seized upon the prince.

In a year the wings were finished, and, on a morning appointed, the maker appeared furnished for flight on a little promontory: He waved his pinions awhile to gather air, then leaped from his stand, and in an instant dropped into the lake. His wings, which were of no use in the air, sustained him in the water, and the prince drew him to land, half dead with terror and vexation.

Ch. VI: From RASSELAS by Dr. Johnson.

Relative Effect of Dihedral and Sweepback*

By MAX M. MUNK

Sweepback was used in some of the early airplanes in order to obtain lateral stability. It is now rarely used except in very moderate values, usually as a modification to correct a tail-heavy condition in an existing design. Dihedral, on the other hand, may be found in practically all airplanes. Since the balancing effects of these two angles are somewhat similar their ratio for the same angle is here investigated.

Only small dihedrals and sweepbacks are considered in this note. Both have but a small influence on the wing air forces, but this is not the subject of this note. The important effect is the unsymmetry of the air force at unsymmetrical flying maneuvers, caused by the dihedral and the sweepback respectively. True, even a wing without any sweepback or dihedral gives an unsymmetric air force, when moved unsymmetrically through the air. The subject of this note is the additional unsymmetry of the air force, that is, in a rolling moment, a yawing moment and lateral force, caused by the sweepback or the dihedral in rolling, yawing or side slipping of the airplane.

Now, it cannot be seen how a wing without any dihedral can experience any considerable lateral force. On the other hand. the lateral force plays no very important part with respect to the lateral stability. Hence, this difference in the action of dihedral and sweepback, though of a fundamental nature, does not decide the question of equivalence or non-equivalence of the two angles.

The yawing moment is chiefly determined by the fuselage and the tail unit. The wings contribute to it no forces except such as are nearly parallel to the chord and these forces are always small. There remains then chiefly the rolling moment to be considered.

*Technical Note No. 177, N.A.C.A.

The Sportford sport plane built by the Aviation Engineering Co. of Lawrance, Kan., which is powered with a modified Ford engine and performs well

Now the rolling moment due to roll is large in itself but it is so even without dihedral or sweepback. It is only slightly modified by these two angles. The same holds true with the rolling moment due to yaw. There remains then at last only one combination, the rolling moment due to side slipping, which is chiefly determined by the magnitude of the dihedral or sweepback. The ratio of the effect of equal dihedral and sweepback on this rolling moment is therefore a sufficient approximation of the desired ratio of their balancing power.

I begin with the effect of the sweepback. The angle of sweepback may be σ, the velocity of flight V. Then in straight flight, only the component velocity $V \cos \sigma$ is effective for the creation of the lift. Since the lift coefficient may be written $2\pi \sin \sigma$, the lift per unit area is

$$L/S = 2\pi V^2 \frac{\rho}{2} \cos^2 \sigma \sin \sigma^1$$

where α^1 is the effective angle of attack ($L = 0$ for $\alpha^1 = 0$).

Now let v/V be the small angle of side slipping. Then the lift per unit area and per unit dynamic pressure $\frac{L}{S} V^2 \frac{\rho}{2}$ is increased or decreased by

$$2\pi \sin \alpha^1 \frac{d}{d\sigma} \cos^2 \sigma \, d\sigma = -2\pi \sin \alpha^1 \sin 2\sigma \frac{v}{V} \qquad (1)$$

since

$$\frac{v}{V} = d\sigma$$

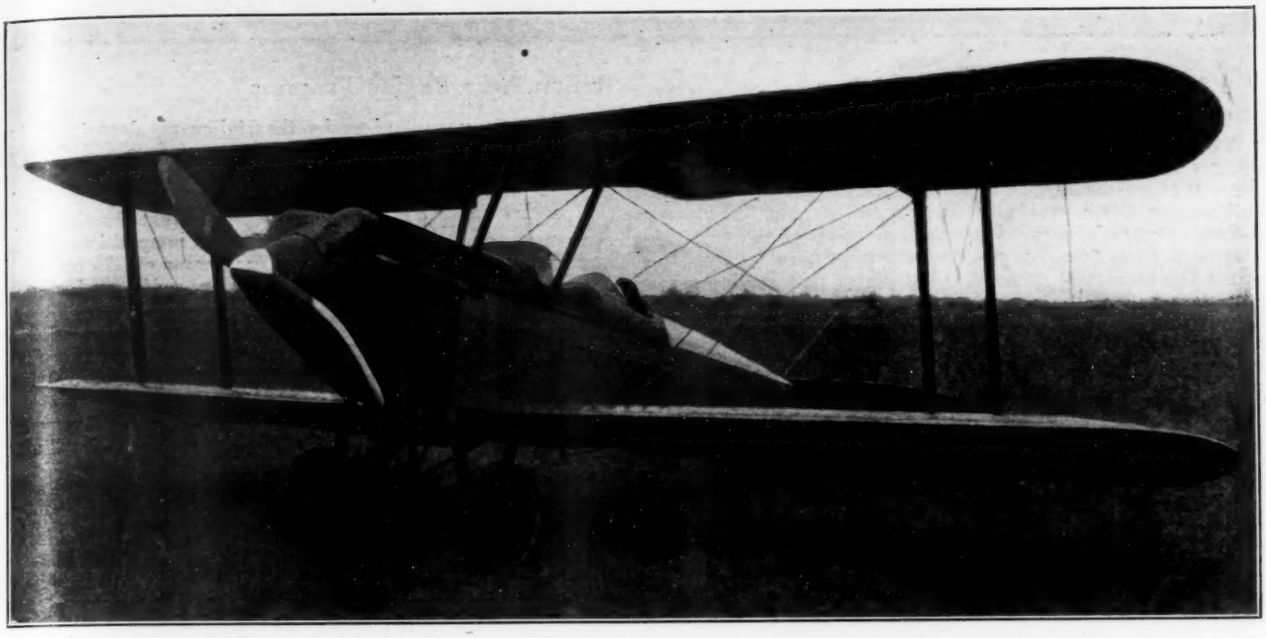
Turning now to the rolling moment, caused by the dihedral γ and side slipping, the effective angle of attack is increased on one side and decreased on the other side by $\frac{v (\sin \gamma)}{V}$ which is the component of the side velocity at right angles to the wing and divided by V. Hence the expression corresponding to (1) is now

$$2\pi \left(\sin \gamma \frac{v}{V}\right) \qquad (2)$$

The ratio of (1) to (2) is approximately $2 \sin \alpha \frac{\sigma}{\gamma}$.

It appears from this rough investigation that the effect of the sweepback is always smaller than that of the dihedral. The ratio depends on the angle of attack, so that at very large angles of attack it may be as much as one-third, whereas at very low angles of attack it is less than one-tenth. The rolling moment at high angles of attack and with correspondingly low velocity of flight is more important than at small angles of attack, as in the latter case the controllability is very good in consequence of the high speed and the degree of the stability is then less important. It can therefore be said that for average conditions the effect of sweepback is one-third to one-sixth of that of the dihedral of equal magnitude.

The 1924 Swallow Commercial Three-Seater



The Model 1924 Swallow, a new commercial three-seater equipped with a Curtiss OX5 engine

Tests have recently been completed at Wichita, Kan., of the 1924 type Swallow commercial airplane developed by the Swallow Aeroplane Mfg. Co. This ship embodies many desirable commercial features such as small dimensions, ease of control, low initial cost, and a very low maintenance cost, together with a wonderful performance for an OX5 motor.

The specifications are as follows:

SPECIFICATIONS

Span	32 ft.
Chord, both wings	5 ft.
Wing area including ailerons	300 sq. ft.
Aileron area	34.8 sq. ft.
Elevator area	16.6 sq. ft.
Rudder area	8.2 sq. ft.
Fin area	3.5 sq. ft.
Stabilizer area	21 sq. ft.
Weight light, with water	1250 lb.
Useful load	700 lb.
Gross weight	1950 lb.
Wing loading	6.5 lb./sq. ft.
Motor	90 hp. Curtiss OX5
Max. speed	95 mi./hr.
Landing speed	35 mi./hr.
Endurance, full throttle	4 hr.
Take off 75 yd. at 1400 ft. with 5 mi./hr. wind	
Ceiling	18000 ft.

The fuselage is of strut and wire construction, having a detachable steel tube motor mounting. The passenger's seat is well upholstered and is 32½ in. wide, giving ample room for two passengers. The tail skid is detachable as a unit and can be taken out and rewrapped with rubber in just a few minutes. The radiator is swung below the fuselage and weighs but 27 lb. The entire cooling system holds only 4 gal. of water and cools sufficiently on the hottest days. The water temperature is controlled by shutters on the radiator. The aluminum gas tank is mounted in the fuselage and holds 33 gal. A reserve of 4 gal. gives the pilot half an hour's flying after he has run out of gas.

The landing gear is of split axle type, with a ground clearance of 20 in. at the center.

There are no exposed control wires in the ship. The elevator cables are doubled and run directly from the stick to the elevator horn which works inside the fuselage. The aileron control cables run directly from the stick control torque tube to a 4 in. pulley in the wing, and from there to the aileron horn. There are only four pulleys in the control system. The aileron action is sensitive and positive in the roughest air.

The wings are of conventional design, the spars being laminated and channeled inside, forming a spruce box spar, which is very light and strong. The ribs are reinforced spruce with spruce cap strips. The internal bracing is four No. 9 wires in each panel.

The elevators and rudder are built entirely of metal, the torsion members are steel tubing with steel ribs and duralumin trailing edge. The stabilizer is built of spruce and is semi-cantilever.

F.A.I. Decisions

An "extraordinary conference" (session) of the International Aeronautical Federation took place in Paris, Jan. 2-5, last, Belgium, France, Great Britain, Holland, Italy, Japan, Roumania, Switzerland and the United States being represented. The work accomplished is indicated under the following subject heads.

Schneider Cup—It was decided to run the race under the same regulations as last year. The closing date of entries was fixed April 1, 1924.

Gordon Bennet Balloon Race—The closing date for entries was fixed April 1, 1924.

Tryptique—The detailed arrangements between the Customs Authorities of the European Countries were considered and approved. The Tryptique only applies to private touring airplanes and will be instituted very shortly.

Records and Replenishments—It was decided to institute separate records where replenishments are taken in during flight, under the following categories: Duration; Distance; Height; Speed over a given distance.

Height—It was agreed that it shall not be necessary to return to the point of departure in attempts on Height Records.

Speed—For Speed Records an excess of eight kilometers per hour shall be necessary to beat the previous record. It was also decided that for greatest speed records over a three-kilometer course the airplane must not exceed a height of 400 meters during its approach to the course.

Light Airplanes—The classification of records for light airplanes was deferred until after the various competitions this year.

1924 Conference—The regular conference for 1924 was fixed to be held in Paris beginning June 21, 1924.

AIRPORTS AND AIRWAYS

New Florida Air Route

Inauguration this month of regular airplane passenger and express service between Tampa and Sarasota, via St. Petersburg, and early extension of operations to Miami is announced by officials of the Tamiami Air Line Co.

Representatives of the company have been in Tampa for several months preparing for the operation of the line, and during the last thirty days or more a large force of mechanicians has been busy assembling the planes and making ready for the start of the service. E. H. Threadgill, general manager, is at Sarasota to complete arrangements there for the landing field.

The company now has three planes ready for service, all of which have already been flown—one at Tampa, which made a flight to Frostproof; one at St. Petersburg, which made a flight to Sarasota, and one at Miami.

The work of the Tamiami Air Line has a 40-acre landing field at St. Petersburg, a 50-acre landing field almost completed in Tampa, a contract for 50 acres at Okeechobee, and is now negotiating for a 45-acre landing field at Miami. It expects to expand eventually to operate a daily schedule to Orlando, Daytona and Jacksonville, but starting in ten days its daily schedule will only be as far as Sarasota, and will continue so until the emergency landing fields between that city and Miami have all been made ready.

The service contemplates taking a business man from Tampa or St. Petersburg to Miami, giving him time to transact his business and get him back home in time for dinner. The single way rate will be $50, but the company hopes to be able when once it is commercially established to cut this price considerably.

The estimated cost of operating a daily schedule between St. Petersburg, Tampa, Okeechobee and Miami, figuring the depreciation, upkeep, maintenance of shops, etc., is approximately $190 a day.

The financing of the company has been almost entirely by Tampa and St. Petersburg men who are anxious to see a short time service from coast to coast.

Chicago News

By Otto Klein

Randolph Page, Superintendent of the Chicago Air Mail field, has acquired an Avro for his personal use. Edward S. Hulsberg of LaSalle, Ill., has purchased a Canuck from Gus Palmquist. After learning to fly his new ship he will take it to his home town where he also expects to erect a hangar.

Elmer Partridge is building a set of Fadge-Collins high lift wings for use with a Jennie fuselage. It will be interesting to note how this wing compares with the well known Sperry high lift wing for Jennies, as the Fadge-Collins wing section is considered by local fliers the most efficient ever designed.

Nimmo Black has completed the overhaul of his Laird and is setting up the ship in anticipation of a flight away from Chicago's icy blasts.

One of the Western Division Air Mail pilots made use of his DH to pay a last minute visit to the Chicago Auto Show. He flew in from Omaha Saturday, Feb. 2.

Aircraft Materials and Flying Equipment

The opening of the 1924 flying season finds Air Transport Equipment, Inc., of Long Island City, N. Y., with a full line of materials and parts for the construction and operation of airplanes. The equipment on hand comprises a great variety of parts of Jennies, all kinds of engines and parts therefor, plywood, textiles, flying coats, helmets, etc.

A. A. Pedu, president of the concern, is also general agent for the Sergant 16 hp. vertical four cylinder engine for light planes which was described some time ago in these columns.

Italian Aero Engine Progress

The encouragement given by the Italian air department to the construction of modern type of aero-engines will shortly bring forth several new types.

A 12-cylinder Vee engine of 450/500 hp. is being completed by the Fiat Co. It is to undergo its tests very shortly prior to competing in the French aero-engine competition. This firm is also building a 12-cylinder Vee engine of 375 hp., and one of 800 hp. In addition a new 300 hp. radial engine is at the moment undergoing test.

The Isotta-Fraschini Co. has completed an engine of 340 hp. known as type V9, which has already undergone its first trials successfully, and a 12-cylinder Vee engine of 500 hp. is nearing completion.

The Colombo Co. has successfully tested a light-powered engine of 20 hp. and has also under construction a 12-cylinder Vee of 450 hp. which will be ready in March.

The Piaggio Co., one of the oldest engineering firms in Italy, which recently took up the construction of aircraft and aero engines, is completing an engine of 15 hp. which is to be fitted into the dual-control light plane at present under construction. In addition to light planes the firm is also building a pursuit plane of 300 hp. and large flying boats to the design of Signor Bastianelli who was previously with the Pegna-Rossi-Bastianelli and the Construzione Navali-Aeronautiche firms.

Swallow Aeroplane Mfg. Co.

The Swallow Aeroplane Manufacturing Co. of Wichita, Kan., has succeeded to the E. M. Laird Co. of the same town as the constructor of the well known Swallow three-seater commercial plane. Mr. Laird's interest was purchased last October by J. M. Mollendick, who incorporated the Wichita Laird Aeroplane Co. under the state laws of Kansas. On Jan. 9, at a stockholders' meeting, the name of the firm was changed to Swallow Aeroplane Mfg. Co.

The officers of the concern are as follows: J. M. Mollendick, president; Walter H. Beach, vice president and general manager; Randall Myers, secretary and treasurer. Lloyd Stearman is chief engineer and William Snook superintendent.

During a trip South just completed, Mr. Beach sold five Swallows of the 1924 model. This ship is described elsewhere in this issue.

Hamilton Propellers

The Hamilton Aero Manufacturing Co., of Milwaukee, Wis., propeller manufacturers since 1909, have recently issued an interesting six-page folder illustrating and describing their manufacturing processes and numerous military, naval, Marine Corps, air mail and commercial ships which are equipped with Hamilton propellers. These installations include the historic NC4 of trans-Atlantic fame and the new Navy airship Shenandoah.

It is stated in the folder that the Hamilton equipment includes propellers for every type of plane and motor from the 1200 hp. airliner to the 10 hp. sport plane.

Hammondsport News

The Navy Department has awarded Airships Inc. of Hammondsport, N. Y. a contract to build replacement gas cells for the naval airship Shenandoah. These gas cells are constructed of goldbeater's skin.

As engineer in charge this company has secured the services of Norman Meadowcroft, who has had a great deal of experience with this work both here and abroad. During the war Mr. Meadowcroft was in charge of gas development for the British government.

Airships Inc. are not only adding to their personnel, but also contemplate a considerable expansion of their plant.

A Long Cross Country Trip

Flying the new Model Four "Petrel" George B. Post of Huff Daland & Co., is making a complete tour of the Southeastern portion of the Country, following an itinerary that has already extended across thirteen States and will roll up a total of over 5,000 air miles before its completion at the factory in Ogdensburg, N. Y.

The Petrel Model 4 is a modification of the original three seater of this name. The Model 4 is equipped with Wright E4 or Hispano Model 4 motors instead of the OX5, and has a

George B. Post, pilot of the Petrel 4 in which he is making a 5000 mi. business trip

steel fuselage with a side by side passenger cockpit, beside embodying many other interesting developments over the original machine.

The Petrel 4 was first flown on Sept. 27, 1923 and by the following afternoon was winging its way to St. Louis, which was reached in 9½ flying hours from Ogdensburg, N. Y.—an average of just under 100 mi./hr. for the 930 mi. trip notwithstanding the handicap of head winds and rain that prevailed at the time. Over 450 lb. of pay load in the form of passengers and baggage was carried on the trip West.

From St. Louis the Petrel was flown to Dayton, Ohio, where exhaustive tests were carried on by the Engineering Division of the Air Service for the purpose of obtaining advance data on the TW5 training plane. The latter is a counterpart of the Petrel except for the cockpit arrangements, and is now in production on a service order of Army training planes for use at Brooks Field next spring.

Performance was held secondary to the general characteristics of controllability, balance and stability during the tests involved, but the very creditable figures of 113 mi./hr. and a climb to 10,000 ft. in 23 min. were obtained on the first flight. while carrying a useful load in each case of 888 lb., made up of passengers, fuel and oil for four hours and miscellaneous equipment.

From Dayton the Petrel was flown to the naval air station at Pensacola, Fla., by way of the National Guard fields at Louisville, Ky. and Nashville, Tenn., and Maxwell Field at Montgomery, Ala. Favorable winds for the first time allowed a s'ow cruising speed on this leg of the journey, and it was found by repeated checks that less than 10 gal. per hour was burned by the old rebuilt model E Hispano, while maintaining an actual air speed of 80 mi./hr., giving a cruising range of well over four hours with a radius of better than 300 mi. in still air or favoring winds.

Some two weeks were spent at Pensacola in order to show the Petrel to the Navy and observe the trials of the Huff-Navy 2 training plane which were being conducted at that time. From Pensacola the itinerary includes a stop at Brooks Field, San Antonio, Tex. and then a return along the Atlantic sea board with stops at Hampton Roads, Washington and New York.

Mr. Post's trip was arranged purely from an educational standpoint using the airplane instead of the train, in accordance with his company's policy of flying their own airplanes under the actual conditions which they were designed to meet.

The Airplane in the Japanese Disaster

An issue of the Japanese publication *Miyako* during the time of the Japanese earthquake dwells on the meritorious flights made by Japanese army airplanes after the outbreak of the earthquake.

Up to the night of the first the conditions in Tokyo and Yokohama were utterly unknown in Osaka, the only piece of information being a wireless telegram saying that fires occurred subsequently to the earthquake. By order of the Minister of War, the B216, piloted by Lieutenant Hadano, with a passenger, started on the second at 9 a. m. without weather observation, the pilot and his mate being determined to run the risk of life. Arriving at Osaka at 3 p. m., it discharged the important errand to the 4th Division. On this account, the condition on the Tokyo front with regard to the earthquake was made known to the western part of the country, and telegrams were sent from Osaka to various parts of the world. The body of the plane became discolored black with smoke. The trip there and back took 9½ hr. On the second between 6 p. m. and 6.30 p. m., the Minister of War gave orders for three airplane flights—one to the 15th Infantry Regiment at Takasaki, the second to the Utsunomiya division, and the last to the 57th Infantry regiment at Sakura. They all reached their destination in the dark and discharged their missions. It was solely due to these "do or die" flights that the troops were able to assemble in and about Tokyo so quickly.

Besides, there are numerous cases where airplanes did conspicuous services in the Japanese disaster. Some of these instances are reconnaissance and propaganda flights made between Tokyo, Yokohama and Sagami, flights connecting Osaka and Tokyo, and a reconnaissance made of the seven islands of Izu.

At the time of the conflagration, the plane while flying over Tokyo was thrown up by the rising currents of air caused by the flames, and the down helm did not respond to the control, so that flying was very dangerous. The flying time up to the ninth was 201 hr. as regards only the flight school; the 2nd, 4th and 5th flight battalions flew 253 hr. The total flying time will be considerably increased if the activities of the Shimoshizu branch of the flight school in the Chiba districts and the 1st and 3rd Flight Battalions in the Osaka region are included.

A Long Over Sea Flight

The belated news just reaches us of a remarkable long distance flight made last November by a Junkers monoplane piloted by Herr Koscielny. The pilot left Naples, Italy, on Nov. 5, and flew across the Mediterranean, via Sardiania and the Balearic Islands, to Barcelona. There wheels were substituted for the floats and the flight continued to Madrid, where the ship arrived on the 7th. The total distance of the flight was 1094 mi.

French Refueling Flight

The refueling flights initiated by the Air Service officers of Rockwell Field, Calif. have recently been emulated with success in France. On Dec. 5 two French military planes piloted by Capt. Pierre Weiss and Warrant Officer V. Van Caudenberg of the 34th Aviation Regiment succeeded in transferring 12 gal. of gasoline in 5 min. through a 100 ft. long hose while flying over Le Bourget.

Canada Claims Arctic No Man's Land

A newspaper despatch from Ottawa, Canada, tends to show that the proposed Arctic trip of the Shenandoah to annex a million miles of more or less problematical territory to the United States has the Dominion government all roused up, so much so that Canada has laid claim to all this vast area and has asked the British Embassy at Washington to keep Canada posted on the plans of Uncle Sam in this much-disputed territory.

The Dominion government, in laying claim to this area, contends that all these lands belong to Canada in that they were transferred to the Dominion by Great Britain in 1880 in a dispatch given at the court at Osborne House, Isle of Wight, during the reign of Queen Victoria.

This dispatch is found in the Statutes of the Dominion of Canada and in part says:

"From and after the first day of September, 1880, all British territories and possessions in North America, not already included within the Dominion of Canada, and all islands adjacent to any such territories or possessions, shall (with the exception of the colony of Newfoundland and its dependencies), become and be annexed to and form part of the said Dominion of Canada; and become and be subject to the laws for the time being in force in the said Dominion, in so far as such laws may be applicable thereto.

(Signed) "C. L. PEEL"

Moreover, by an Order in Council of Oct. 2, 1895, the Canadian government divided the whole of the unorganized and unnamed districts of the Northland into four provisional districts to be named Ungava, Franklin, Mackenzie and Yukon.

According to this Order in Council it embraced all of the lands and islands in theArctic Archipelago and included everything that is not ice between Canada and the North Pole. It takes in, according to the Dominion government, every mile of the land that Secretary Denby proposes to annex.

On the other hand, the Canadian government claims that under the accepted interpretation of international law, Canada, as a result of effective occupation, has a right to this area as Canadian expeditions have been continually visiting these areas.

New American Glider Tested

As a result of a glider flight held at Wheeler Field Friday afternoon, Jan. 11, says the Honolulu *Advertiser*, during which he remained aloft 46 sec. and traveled approximately 1200 ft., Lieut. Hiram W. Sheridan will probably be sent to Berkeley in August to compete in a glider contest there. He may subsequently be sent to England and France to study.

The right skid of the glider was broken in landing, but due to the fact that conditions were not altogether favorable the flight is taken as unusually successful. Lieutenant Sheridan was heartily congratulated by Maj. Gen. C. T. Menoher, in command at Schofield, and Maj. R. E. M. Goolrich, commander of Wheeler Field.

The Hawaiian Department is now planning to secure the latest glider equipment from McCook Field, Dayton, Ohio, and make a definite attempt to establish a world's glider record.

The flight also marked the introduction of a new method of determining air currents. By the scheme worked out by Lieut. Patrick Powers of the chemical warfare service, smoke grenades were shot into the air to determine the air currents.

Records of the flight were made by representatives of the National Aeronautic Association, and these will be sent to F.A.I. headquarters in Paris.

Construction of Brazilian Air Base

The federal government of Brazil has let to a native firm of contractors a contract for the construction of a naval air base comprising four hangars for seaplanes and embodying all the latest improvements in structures of this class, according to a report from Consul Herndon W. Goforth. It is estimated that the new air base will cost in the neighborhood of $400,000 and that the contractors will be on the market for a considerable quantity of structural steel. The contracting company is known to be friendly to American exporters and during 1922 imported nearly $1,000,000 worth of construction materials and equipment from this country.

New British Airliners

The newly formed Imperial Air Transport Co. proposes to put in service several new air liners. Among these is a modified DH34, which will have a greater wing area than the present model. This change, it is hoped, will reduce the landing speed, which is now about 70 mi./hr. A larger single-engined airliner is also under construction. This ship, the DH54, will be equipped with a Rolls Royce Condor 700 hp. engine and will carry fourteen passengers in addition to the crew. Its span will be about 70 ft., or 20 ft. greater than that of the DH34.

The Handley Page company is completing an order for four three-engined airliners of a new type which have been ordered by the Belgian airline operating in the Congo. This type is equipped with a 450 hp. Napier Lion engine in the center and two 240 hp. Siddeley Puma engines in wing nacelles. The designed pay load is twelve pasengers or one ton of freight.

It is also reported that the British air ministry has placed orders for three "imperial transport" planes for communications with Egypt, India and Austria—two ships being ordered from Handley Page and one from De Havilland. These ships will be entirely built of metal, including the propellers, to withstand the great temperature changes in the tropics. They will have a cruising speed of 100 mi./hr. and a cruising range of 1200 mi.

New Airport for Berlin

Further development of the new airport at Tempelhofer Field, near Berlin, is under way, according to the Department of Commerce. This airport for some time has been the landing place of all air connections with Berlin, used jointly by the Aero-Lloyd A. G. and the Junker Co. A limited liability company has now been formed, under the name of the Berliner Flughafengesellschaft, which, with the participation of the other two companies, will undertake still further development of this station.

Berlin itself is taking a very active interest in the field with the expectation that, if municipal financial aid can not be granted, a subsidy from the government will be forthcoming.

This field has been organized to take the place of Johannistal, which was too distant from the city for the purposes of effective air transport.

Chinese Air Line Proposed

The Chinese government at Pekin has decided to start an aviation service between Pekin and Sinkiang, according to advices received by the automotive division, Department of Commerce, from Commercial Attache Julean Arnold, Pekin, China. The government has announced that no foreign loan shall be contracted for the enterprise. The Aviation Department has been instructed to execute the scheme already drawn up.

Long Flight in South Africa

On Jan. 4 a military plane of the South African Air Force, carrying beside the pilot a press representative, flew from Cape Town to Pretoria, a distance of over 1100 mi., which it covered in 10 hr. flying time. The fastest trains take 36 hr. for this trip.

Air Mail Gets Collier Trophy

The Contest Committee of the N.A.A. announces that after all claims submitted to the Collier Trophy Committee were reviewed, it was the unanimous decision of the Committee to award the Collier Trophy for the year 1923 to "the pilots and other personnel of the U. S. Air Mail Service for successfully demonstrating to the world the practicability of night flying in commercial transportation." The Committee felt that the above could rightfully be considered the outstanding development of 1923.

The Collier Trophy Committee is composed of Orville Wright, chairman; Dr. George H. Lewis, Lt. Col. F. P. Lahm, Porter H. Adams and B. Russell Shaw.

U. S. ARMY AND NAVY AIR FORCES

U. S. ARMY AIR SERVICE

New Radio Station at Wilbur Wright Field

For several weeks the new radio station at Wilbur Wright Field, Fairfield, Ohio, has been in experimental operation with results assuring that all that was anticipated with the installation of this station will be realized.

Two stool antennae masts 165 ft. high are provided, set directionally with the city of Washington. Suspended between these masts is a five-wire antennae stretching 475 ft. between the masts. From the center of this antennae a five-wide "lead-in" drops vertically to the radio hut. The radio hut is the center of a ground system consisting of copper bands one-eighth inch thick and eight inches wide laid on edge in three concentric circles. The outer circle has a radius of 250 ft., the center a radius of 125 ft., while the center circle forms the center point and closely surrounds the radio hut. The concentric circles are joined radially at nineteen points, the whole being thoroughly bonded and buried approximately 36 in. in the ground. From the center circle copper tubes are used as leads and brought up through the radio hut for the ground connection for the set.

The set is of standard Signal Corps type, manufactured by the General Electric Company, and is known as a 6-tube regenerative set. Plate current at about 1500 volts is furnished by a two kilowatt direct current generator driven by an alternating current motor, current for which is taken directly from the power lines. The normal radiation of the set is 10 amperes, but it has an emergency capacity of double that amount. Under perfect conditions the radiating limit of the set would be infinite, but its commercial effectiveness is considered to be about 1,000 mi.

The major duty of this station will be to receive, coordinate and broadcast meteorological information to and from various Air Service airdromes included within the Model Airways. At the present time a regular flying schedule is maintained over the Model Airways between Mitchel Field, Long Island, N. Y.; Bolling Field, Washington, D. C.; Langley Field, Hampton, Va.; Langin Field, Moundsville, West Va.; Wilbur Wright Field, Fairfield, Ohio; McCook Field, Dayton, Ohio; Chanute Field, Rantoul, Ill.; Selfridge Field, Mt. Clemens, Mich.; and Scott Field, Belleville, Ill. Weather reports from each of these stations are received daily at 7.50 a. m. and every two hours thereafter until late in the afternoon. These reports are consolidated at this station and the summary or consolidation immediately broadcasted to all Model Airways Airdromes, where the information is immediately posted to their bulletin boards maintained for such purpose, so that all pilots may have first hand information as to weather conditions over the route which they are about to travel. In addition to this regular service, special items as to local storms and local conditions will be relayed to the central station for whatever value it may have for broadcasting.

Arrival and departure of all pilots is immediately broadcasted to Airways Headquarters at Bolling Field, the place of destination of the pilot (if any), and to the home field of the pilot, thus enabling the location of all pilots to be plotted at any given time and their arrivals anticipated.

In addition to the regular service furnished the Model Airways, a complementary service is maintained with the Air Mail Service, such information as the Air Mail having of value to the Air Service being radioed to an Air Service station, while the Air Mail receives the general broadcast from the central Air Service station.

Broadcasting from this station will ordinarily be upon a 1500 meter wave length. An emergency set having a range of 3,000 mi. and similar to that now in use by the American Shipping Board for communication with the Shipping Board Fleet is also to be installed at a later date as a precautionary measure.

This station is also a part of the regular Army radio net which covers not only the United States and foreign possessions, but all Navy ships in harbor or at sea, so that it is possible to communicate directly or by relay from this station with any point where our flag may fly, and receive a reply from that point with the smallest possible loss of time.

France Field Pilots Fly to Costa Rica

The following is translated from an article which appeared in *Diario de Costa Rica* on Dec. 28, 1923, touching on the flight of three Army airplanes from Panama to Costa Rica:

"A few minutes after 11 o'clock the landing field offered a gala appearance. A crowd of more than 5000 people had gathered there, the field being marked off by white flags. To the left of the field and a little to the back was the reviewing stand, draped with the colors of the United States and Costa Rica. About 12 o'clock the President of the Republic, Julio Acosta, arrived, accompanied by his aide. There were already assembled there the Secretary of State and the Minister of Public Affairs, Messrs. Aquiles Acosta and Miguel Obregon. Making preparations to receive the aviators and waiting for them were Cols. Jose Maria Pinaud and Francisco Bonilla, members of the Aviation Committee. At 11:30 a. m. his excellency, Roy T. Davis, United States Minister, arrived accompanied by the Secretary of the Legation.

"A little before 12.30 there appeared on the western horizon the three planes which advanced in the form of a triangle. The crowd then went wild; everyone wanted to get a better view of the planes, without thinking for a moment of the danger they were likely to encounter in going out on the field.

"The three aviators encircled the field, flying toward the east in the general direction of the city, and after making a few turns they landed, one by one, amid the cheers and applause of the crowd. In the name of the government and on behalf of the reception committee, Colonel Bonilla received the aviators. Then they were greeted by Mr. Davis, the President of the Republic and the Minister of Public Affairs. The aviators were conducted to the Hotel Europa where they were taken care of by the entertainment committee. Maj. Follett Bradley commanded the flight, the pilots of the planes being Capt. O. H. Quinn, Camp. H. M. Smith and Lieut. W. H. Reid. Two expert mechanics came with them—James Gall and V. C. Hawley.

"The three valiant aviators making the first international flight from Panama to Costa Rica left Colon (Panama) at 7:40, arriving at David (Pacific) at 9:45 a. m. They then left for Costa Rica, following the coast until they reached Puntarenas. Major Bradley stated that they took a longer time to make the trip because they didn't go over the mountains, due to the heavy mist and therefore they went to Puntarenas, then to the East, following the railroad until they reached the field, landing at 12:25.

"The return of the aviators will be on Wednesday, Jan. 2, leaving the field about 7 or 8 o'clock for Panama. We do not wish to close this article without extending to Major Bradley and his companions our greetings of welcome."

Lighter-than-Air Training for Airplane Pilots

The Training and War Plans Division, Office Chief of Air Service, is desirous of having a number of officers of the heavier-than-air branch of the Army Air Service detailed to take the course at the Balloon and Airship School, which will commence about Sept. 15 next and end about June 20, 1925. Announcement is made that a limited number of applications will receive favorable consideration.

Those officers of the heavier-than-air branch who are desirous of pursuing the next lighter-than-air course at the Balloon and Airship School at Scott Field, Belleville, Ill., should lose no time in filing their applications in due form.

Supply Arrangements for World Flight

The supply activities in connection with the world flight of the Army Air Service have been carefully worked out by Property Maintenance and Cost Compilation, and it is believed that this is the first time a supply program has been devised in such great detail.

Spare parts for planes and engines, a fairly complete outfit of tools, small quantities of standard utility parts, and material such as tubing, shock absorber cord, plywood, and items other than spare parts are being sent to each station on the route of the proposed flight. The spare parts and tools are packed in specially constructed boxes which have been designed at the Fairfield Air Intermediate Depot and built in the repair shops. The boxes themselves are constructed of ash, spruce and plywood, so that they may be used for the furnishing of wood for emergency repairs if necessary. Carpenter tools for working up the wood are sent in the tool chests. Tubing and other items which cannot readily be bent are packed with the propellers in lengths of six feet or more.

All of the shipments to points east of Calcutta are to be sent from Fairfield to Seattle, where they are to be loaded on shipboard, while all shipments to Karachi, India, and parts west of it are sent to New York. The weight, cubic contents and dimensions of every article have been carefully considered and about 480 separate items are being sent to each station.

19th Pursuit Squadron to Luke Field

The 19th Pursuit Squadron, stationed at Wheeler Field, near Schofield Barracks, H.T., is, according to latest reports received, making preparations to move to Luke Field and Ford Island for permanent station.

The squadron consists of eight officers and 93 enlisted men and approximately ten pursuit ships. First Lieut. H. M. Elmendorff is in command of the squadron with the following staff: 1st Lieut. H. E. Woolridge, Adjutant; 1st Lieutenant Chenault, Engineering Officer; 1st Lieut. L. C. Blackburn, Asst. Engineering Officer; 1st Lieut. F. A. Lundell, Supply Officer; 1st Lieut. L. C. Mallory, Mess Officer; 1st Lieut. W. A. Clark, Communications and Armament Officer, and 1st Lieut. H. W. Sheridan, Operations Officer.

Col. Graham Addresses Chicago Airmen

Lieut.-Col. William R. Graham, Asst. Chief of Staff of the Sixth Corps Headquarters, located in the central manufacturing district of Chicago, was the guest of honor recently at the monthly dinner of the Air Service Officers' Association at the Army & Navy Club, Chicago. Colonel Graham spoke on various phases of military intelligence, particularly the work of the Military Intelligence Association of Chicago, which he organized and built up to a high degree of efficiency.

Other guests included Lieut. Col. Arthur P. Watt, Executive Officer non-divisional group; Major Wm. S. Wood, and members of the Military Intelligence Association. A large group of Air Service reserve officers were present.

General Patrick Returns from Panama

Maj. Gen. Mason M. Patrick, Chief of Air Service, just returned from Panama, where he inspected the Air Service troops stationed there and conferred with the Department Commander, Gen. Samuel D. Sturgis, relative to the air defenses of the Canal Zone.

Army Orders

Sec. Lieut. George Leroy Murray, A.S.O.R.C., to active duty as student, communications course, Technical School, Chanute Field, from Jan. 21, reverting to inactive status by June 15.

Four months' leave to First Lieut. John Y. York, jr., A.S., after present foreign service tour, with permission to return to U. S. via Suez Canal.

First Lieut. Carl A. Cover, A.S., Langley Field, to Air Intermediate Depot, Fairfield, effective Jan. 25.

First Lieut. Paul L. Williams, A.S., relieved from duty Crissy Field and granted two months' leave from March 3, to sail for Manila by transport leaving San Francisco May 5, for duty with A.S., Philippine Department.

Maj. Junius W. Jones, A.S., relieved from duty Mitchel Field and granted twenty days' leave from Jan. 31, to sail by transport leaving New York Feb. 21 to Canal Zone, for duty with A.S., Panama Canal Department.

First Lieut. Victor E. Bertrandias, A.S., Mitchel Field, to Langley Field, on expiration of leave granted.

Capt. Hubert V. Hopkins, A.S., relieved from duty Kelly Field on Jan. 31, granted one month's leave with permission to apply for one month's extension, to proceed thereafter to San Francisco for temporary duty with Ninth Corps Area; thence to Honolulu, by transport sailing April 8, for duty with A.S., Hawaiian Department.

One month ten days' leave to First Lieut. Silas C. Hyndshaw, A.S., from March 5.

Orders July 27 Sec. Lieut. Delma Hudson, A.S.O.R.C., revoked.

First Lieut. Max F. Schneider, A.S., relieved from duty Kelly Field and granted one month's leave from March 12, thereafter to proceed New York City and sail on transport leaving April 16 for Canal Zone, for duty with A.S., Panama Canal Department.

First Lieut. Fred C. Nelson, A.S., Fort Sill, detailed as instructor, Missouri National Guard, with station at St. Louis, on expiration of leave granted.

Sec. Lieut. James E. Gardner, A.S., Fort Sam Houston, to report to Brig. Gen. Benjamin A. Poore, President, Army Retiring Board, for examination.

One month fifteen days' leave to First Lieut. Mark H. Redman, A.S., from Jan. 28.

Capt. Frederick R. Lafferty, A.S. (Cav.), now en route from Philippines, relieved on arrival from A.S. detail and attached to 11th Cav., Presidio, Monterey, on expiration of leave granted.

Maj. James Kirk, A.S., transferred to Ordnance Department, effective Jan. 15.

Orders Jan. 15, relieving Sec. Lieut. Townsend Griffiss, A.S., Kelly Field, and directing him proceed Philippine Islands on transport leaving San Francisco July 19, revoked.

Following-named A.S. officers to duty Kelly Field on completion of present training course, Advanced Flying School, that station: Capt. Robert C. Candee (Cav.); First Lieut. Frederick M. Hopkins, jr.; Sec. Lieut. John S. Griffith (Inf.); and Sec. Lieut. Hilton W. Long.

Orders April 23 and May 8 First Lieut. Solomon L. Van Meter, jr., A.S., directing Lieutenant Van Meter report to C.O., Walter Reed General Hospital for observation and treatment and relieving him therefrom, respectively, revoked.

Sec. Lieut. Hilbert W. Wittkop, A.S., Kelly Field, to San Francisco, expiration one month fourteen days' leave from June 3; thence to A.S., Philippine Department, Manila, transport sailing July 19.

Sec. Lieut. Landon C. Catlett, jr., A.S., Kelly Field, to San Francisco, expiration two months' leave from April 29; thence to A.S., Hawaiian Department, Honolulu, transport sailing July 2.

First Lieut. William V. Andrews and Sec. Lieut. Ralph A. Snavely, A.S., Kelly Field, to San Francisco; thence to A.S., Philippine Department, Manila, transport sailing July 19.

Orders Dec. 12 First Lieut. Roderick N. Ott, A.S., amended to read: Lieutenant Ott, Brooks Field, to New York City, expiration two months' leave from Feb. 11; thence to A.S., Panama Canal Department, transport sailing April 16.

Sec. Lieut. Albert G. Kelly, 17th Inf., Fort Crook, to A.S., Primary Flying School, Brooks Field, for training, from March 1.

Maj. John H. Jouett, A.S., Langley Field, to A.S. Primary Flying School, Brooks Field, for training, by March 17.

Anti-Aircraft Battery Wants Recruits

Two anti-aircraft searchlights of more than 1,000,000 candlepower were recently shown in action on Times Square, New York, to stimulate recruiting in the anti-aircraft branch of the N. Y. National Guard. The exhibition was arranged by Capt. A. B. Chase and Lieut. J. F. Stokes of the 1st Battalion, 212th Artillery, Anti-Aircraft Division of the N.Y.N.G.

Applicants will be examined at the armory, 62nd St. and Columbus Ave.

WE'RE ALMOST THAT FAR ALONG ALREADY

Courtesy N. Y. Tribune

U. S. NAVAL AVIATION

Aircraft Tenders for the Arctic Flight

Some interesting particulars are on hand regarding the two aircraft tenders which the Navy proposes to use in conjunction with its Arctic air expedition next spring. It will be remembered that in addition to the airship Shenandoah six planes will participate in the expedition, the heavier-than air craft being assigned the task of short distance reconnaissance work and aerological observations. The planes will operate from two aircraft tenders stationed at Alaska and Spitsbergen, respectively. These tenders will, at the same time, act as advance bases for the Shenandoah.

To speed up the work of the expedition, the Navy Department is converting two fuel oil tankers, the Ramapo and the Patoka, into aircraft tenders of the above described type. These tankers are single screw vessels of 16,800 tons displacement and are 477 ft. long and 60 ft. in beam. Most of the interior, according to present arrangement, as taken up with stowage tanks for heavy oil and gasoline. The sketch of the ships as they will appear when converted shows a steel tower of triangular cross section, which rises 115 ft. above the water line, thus being 50 ft. lower than the mooring mast at Lakehurst naval air station. At the top is a platform and gangway for the passage of men into the airship, and above this platform there is located a goose neck swivel which secures the nose of the ship. On deck the winches for hauling in and slacking away on lines are provided as in the case of masts on land. Similarly, pipe lines are provided for carrying fuel, gas and water to the airship. Unlike the land mast, however, the ship's mooring mast will have no elevator, and the crew will have to climb up a ladder to go on board ship.

The airship tender will carry on board complete parts for the engines and other auxiliary machinery of the Shenandoah. Tanks of helium gas will be stowed on board and there will be ample machine shop facilities for repairs and necessary mechanical work as well as shop space for fabric work on the outer covering and gas cells of the airship. Laboratories will also be provided where the delicate navigational instruments may be repaired and checked, and where the radio apparatus will be overhauled. Not the least important will be comfortable quarters for the airship's crew where the men may seek rest and relaxation after a long flight.

On the deck amidships of the vessel is provided a space for the carrying of planes. It is expected that two or three planes will be carried on each ship. They will be of the CS type, recently developed by the Bureau of Aeronautics for long distance scouting and bombing operations. Specially designed for stowage on shipboard, these planes may be stored with their wings folded back to economize space. Each plane will be equipped with a radio sending and receiving set for communication with the mother ship when away on a flight. The airship will also be able to keep track of its position when out of sight of landmarks over the Arctic ice pack, by means of radio compass bearings from the tender.

It is quite likely that navigation by this means will be relied upon to a great extent for there will quite probably be serious difficulties in the way of using ordinary means of navigation in the Arctic. For one, the magnetic compass will probably prove wholly unreliable under the influence of the magnetic forces known to be prevalent in northern latitudes. And the gyro compass, upon which mariners have come to rely in later years, is not to be depended upon in latitudes north of 70 deg.

Tests of Naval Arctic Plane

The CS2, one of the six planes destined for the U. S. naval Arctic air expedition, made a successful test flight last week at Mitchel Field, L. I. The plane was built by the Curtiss Aeroplane & Motor Co., Inc. of Garden City and is equipped with a 650 hp. Wright engine. It differs from the CS1 "three-purpose" plane of the Naval Air Service in several respects, one of which is the great cruising range of the CS2, said to be 3000 mi. The center section of the top wing, which is 56 ft. in span, forms the main gasoline tank with a capacity of 270 gal. The top speed of the plane is 110 mi./hr.

CALENDAR OF AERONAUTICAL EVENTS

March 7-8.	Curtiss Marine Flying Trophy Race and Flying Meet, Miami, Fla.
March 15.	Start of World Flight of the U. S. Army Air Service, Los Angeles.
March 31.	Closing date for papers submitted to Royal Aeronautical Society of Great Britain for the R38 Memorial Prize.
April 23.	National Balloon Race, San Antonio, Tex.
April.	Start of U. S. Naval Arctic Air Expedition.
June 3-11.	International Aircraft Expositon, Prague, Czechoslovakia.
June 15.	Gordon Bennett International Balloon Race, Brussels, Belgium.
June 22.	Commodore Beaumont International Cup Race for high speed airplanes, Istres, France.
July 5-6.	Zenith International Airplane Efficiency Race, Paris, France.
August.	"Tour de France des Avionnettes." International Round-France race for light airplanes.
Oct. 2-4.	International Air Races, incl. Pulitzer Trophy Race, Dayton, Ohio.
Dec. 17.	Twenty-first anniversary of the first successful airplane flight.

BACKFIRES

"French Girl Confounds All the Scientists by Using Parachute to Drop from Fast Plane"—says a two column head in *The New York Times* over an exclusive news story from Paris, which reads in part as follows:

"Theory and computation were confounded when a young woman—Mlle. Collin—leaped from an airplane travelling 180 kilometers an hour, opened a small parachute and descended safely to the ground, where her terror-stricken friends were awaiting to accompany her to a hospital.

"In answer to the often-asked question why fliers are not furnished with parachutes scientists have responded that a parachute employed by a person leaping from a fast airplane would open with such a tremendous shock as to break the bones of the unfortunate passenger.

"According to Mlle. Collin, contrary to calculations of all the scientists, there was no shock when the parachute opened, but on the contrary she had the sensation of being suddenly and gently suspended in the sky."

Somebody must have been pulling the leg of the *Times'* Paris correspondent, inasmuch as parachute drops from airplanes have become a regular feature of French flying meets, women in particular engaging in them with great success. Hence Mlle. Collin only seems to have confounded the unwary correspondent.

* * *

The drawbacks of being too clever are clearly indicated in the following story told by C. G. Grey, Editor of *The Aeroplane*, in connection with the English light plane meet at Lympne.

"A certain technical official who has a high reputation for skill in handicapping and in the use of that horrible calculating machine known as a slide-rule departed from his office for Hythe remarking at large, 'Thank Heaven, I shan't see a slide-rule for a week.' Thereafter an evil person in his office wrote to every firm known to make or sell slide-rules asking that particulars of these instruments be sent forthwith addressed to 'Captain ——, The Hotel Imperial, Hythe.' So about the middle of the week there arrived for the said official baskets-full of letters and parcels and packages all containing illustrations and specifications and descriptions of slide-rules of all sorts, long and short, fat and thin, circular and straight.

"After a day or two of this the unhappy victim became so tired of being begged to buy a slide-rule that he ceased to open letters addressed to him. And among the neglected letters was one from the Superintendent of an important Air Ministry Establishment asking him to bring his car and meet a certain train at a certain station and fetch him (the Superintendent) to the aerodrome. As the result the Superintendent had to walk three miles and carry his own suit-case. He said that he enjoyed the exercise and he certainly enjoyed the joke. But the originator of the jest is probably hoping that he may remain anonymous."

* * *

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Publisher's News Letter

The visit of C. R. Fairey, Chairman of the Society of British Aircraft Constructors to this country is greatly welcomed. Mr. Fairey, as everybody who is familiar with British aviation knows is the present titular head of the British Aircraft Industry. Mr. Fairey is famous abroad as a seaplane designer and as the inventor of the Fairey Flap Gear and the designer of the Fairey Flycatcher which has the biggest speed range of any machine in the world. Such a distinguished visitor will be greeted by everyone with the greatest cordialty.

* * * *

Perhaps it will not be out of place to speak of the engaging personality of our English guest. He is one of the most impressive and forceful figures that it has been our pleasure to meet in a long time. And he is not only what can truly be termed a "big" man physically. His every comment on things aeronautical indicates a broad understanding of the problems of the air as well as the commercial necessities of seaplane construction. His visit, like that of his colleague Commander Bird of the Supermarine Company, will be productive of much good, through the interchange of ideas and experiences in the development of aircraft as a national power. We take the liberty of extending to him the welcome of American Aviation.

* * * *

These English visitors have made clear the great importance of solidarity in an aircraft industry. The business condition of all the English constructors and the harmonious relationship that they maintain with the British Government can be studied in this country with good results. Probably a part of this favorable position is due in a large part to the lack of government competition. In this country the industry has to compete with the government's civilian employees not only in design but in manufacture of new and reconditioned aircraft. At Pensacola we hear that 600 workmen are engaged in aircraft construction work. At Philadelphia, the Naval Aircraft Factory employs over a thousand workmen on various aircraft activities. At McCook Field there is much work going on that would under English conditions be done by the industry, and at Fairfield there is another group at work on aircraft construction. At a conservative figure, the Army and Navy Air Services have two or three times as many workmen employed as are employed in the whole aircraft industry. This is one of the reasons for the gradual disintegration of our aircraft industry.

* * * *

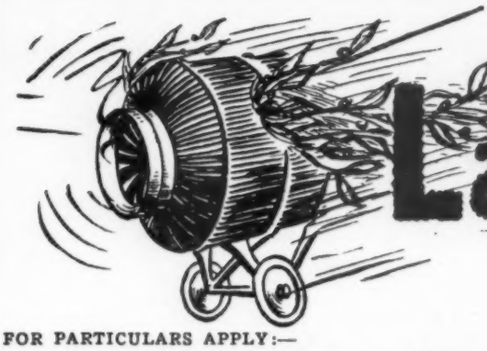
The announcement of the retirement of Maj. Charles J. Glidden from the editorial management of *The Aeronautical Digest* has been sent to us. In this connection it is a pleasure to pay a deserved compliment to one of the figures in aviation who, in the last few years has devoted his ability and services to the upbuilding of American Aviation. Ever since the war Major Glidden has proclaimed the coming of air transport in his paper and numerous writings. In his retirement from active editorial work, he deserves commendation for his persistent confidence in commercial aviation.

* * * *

Major Glidden's career has been of great interest. He was one of the pioneers of the telephone industry having obtained the first telephone subscriber in the world. He organized many telephone companies and after his retirement from active business made two trips around the world by automobile, these trips taking eight years. He drove his car 100,000 miles in 39 countries of the world.

* * * *

Major Glidden has always been an enthusiastic devotee of air travel. Starting in 1908 he made fifty balloon ascensions in France, England and the United States and holds Balloon Pilots License No. 12 in the Aero Club of America lists. During the war, Major Glidden entered the service as a Captain and served at various posts in the country, devoting his talents largely to recruiting. He started *The Aeronautical Digest* in 1922 and has been its Editor since that time giving it a pictorial excellence and popular quality that has gained it many friends. His active resourcefulness we are told will continue to be engaged in aeronautical work but along commercial aircraft development lines.



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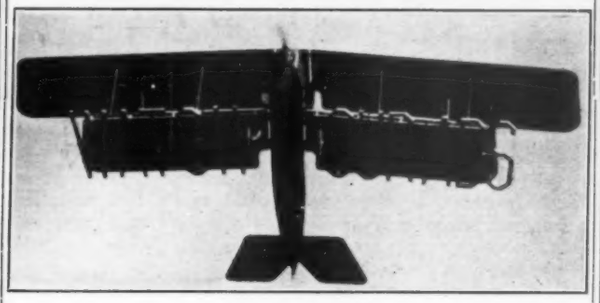

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